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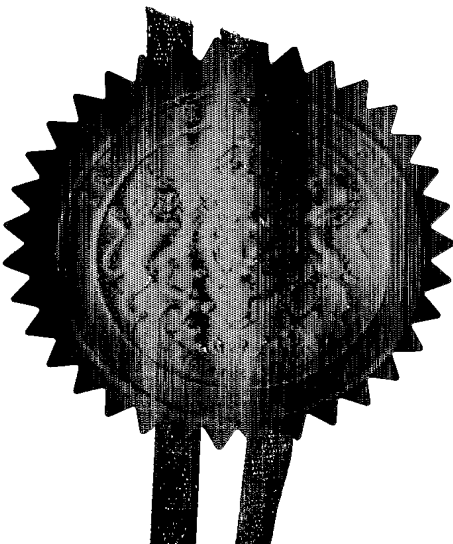
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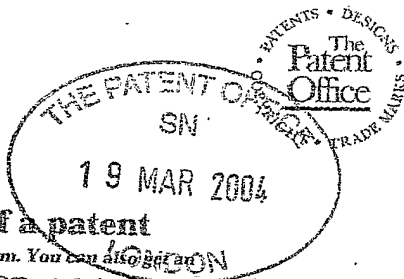
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3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

8833428001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

A Hedge Cutter

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

BROOKES BATCHELLOR LLP

102-108 Clerkenwell Road  
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Country

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Date of filing  
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

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No

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Description

7

Claim(s)

2

Abstract

Drawing(s)

7 + 7 SN

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Request for preliminary examination and search (Patents Form 9/77)

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11.

I/We request the grant of a patent on the basis of this application.

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Brookes Batcheller

Date

19/03/2004

12. Name and daytime telephone number of person to contact in the United Kingdom

Chris Pierce

020 7253 1563

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## A Hedge Cutter

The invention relates to an extendable hedge cutter.

- 5           The reach of known hedge cutters is limited to the length of their cutting heads. This can make the maintenance of wide or tall hedges, or shrubs difficult and dangerous for a user, for example when a user has to overstretch themselves or has to use a ladder to reach otherwise inaccessible parts. This problem may be solved by providing hedge cutters which have a reach that can be extended to an appropriate length when required.
- 10          Hedge cutters having a reach which can be extended are known. However the known hedge cutters suffer from a number of problems.

- One known type of extendable hedge cutter has an extendable handle. The handle is extendable from the main body of the hedge cutter and the user may use the extended handle to obtain a greater reach. These cutters however suffer from the
- 15          disadvantage that the whole of the main body, including the engine, and the cutting head, are moved away from the user unbalancing the machine and making it difficult and heavy for the user to manipulate. Such handles can be provided as cradles for supporting the hedge cutter body or as extending poles with a holding point for the user at one end and the engine and cutting head located at the opposite end.
- 20          It is preferable to provide an extendable hedge cutter in which the drive means of the hedge cutter is kept close to the body of the user allowing for easier balancing of the tool and for easier manipulation.

- Extendable hedge cutters in which the main body, including the drive means, is held by the user and the cutting part is extendable away from the main body are also
- 25          known.

          For example the hedge cutter disclosed in US4654971, is provided with an engine; a cutting head; and a plurality of telescoping concentrically aligned drive shaft

sections connecting the engine and cutting head and allowing the cutting head to be moved away from the engine. This cutter has disadvantages however, because a gear box must be provided in combination with the cutting head, this increases the weight at the head end of the cutter unbalancing the cutter and increases the difficulty and costs of manufacture and maintenance. It is also disadvantageous because rotary drive shafts are susceptible to twisting and bending in the event of a jam occurring in the cutting head.

As a further example the extendable chain saw disclosed in US4760646 is provided with an engine in the main body held by the user; a cutting head; a telescoping boom extending between the engine and the cutting head; a power transmission means; and a gearing arrangement located in close association with the cutting head.

#### Statement of Invention

According to the present invention there is provided a hedge cutter comprising; a cutting head including first and second elongate bladed members, in which the second bladed member is adapted to move back and forth longitudinally relative to the first bladed member to effect a cutting action; drive means arranged to reciprocate the second bladed member; and means for setting a direct or indirect connection between the second bladed member and the drive means at at least two positions on the drive means so as to adjust the overall reach of the cutter.

#### Brief Description of the Drawings

Embodiments of a hedge cutter in accordance with the invention will now be described by way of example only and with reference to the accompanying figures of which:

Figures 1 (a) and (b) show perspective views of an extendable hedge cutter in the non-extended state and the extended state respectively;

Figure 1(c) shows a section along the line A-B of figure 1 (b);

Figures 2 (a) and (b) show sections of a cutting head and a drive shaft of a hedge cutter in the non-extended state and extended state respectively;

Figure 3 shows an exploded view of a cutting head in combination with a drive member;

Figure 4 shows an exploded view of a drive member and part of a cutting head;

Figure 5 shows a plan view of a cutting head and a portion of a drive member;

Figure 6 shows a plan view of a connecting portion of a cutting head and drive member;

Figure 7 shows a side view of a connecting portion of a cutting head and drive member;

Figure 8 shows a bottom view of a connecting portion of a cutting head and drive member;

Figure 9 shows a plan view of an end of a cutting head.

Figure 10 shows an underside view of an end of a cutting head.

#### Detailed Description

An extendable hedge cutter 1, as shown in figures 1 (a) and (b) has a main body 2; a drive means comprising an engine or motor and a reciprocating drive member 4 (shown in figure 1 (c)); and a cutting head 5. The main body 2, houses the drive means and incorporates means such as a handle 3, by which a user can hold the main body 2.

The cutting head 5 is usable in the retracted position shown in figure 1(a) and in the extended position shown in figure 1(b), and can be moved between the two positions by a user. The hedge cutter can be used in the retracted position for close quarters work and in the extended position when a greater reach is required. This is advantageous because a single cutter can be used for both types of work.



As illustrated in figures 1 (a) and (b), and 2 (a) and (b), the cutting head 5 is comprised of an elongate fixed bladed member 6 provided with blades 8, and a elongate reciprocating bladed member 7 provided with blades 9. The reciprocating blade is moved longitudinally back and forth relative to the fixed blade 6, effecting a cutting action  
5 between the blades 8, 9.

In this particular embodiment the drive member 4, is connected to the reciprocating bladed member 7, by a pin 10. The pin 10 is snugly received into one of two longitudinally spaced holes in the reciprocating bladed member 7. A first hole 11 is located at the end of the reciprocating bladed member 7 which is furthest from the main  
10 body of the cutter and a second hole 12 is located at the end of the reciprocating bladed member 7 which is closest to the main body of the cutter. When the pin 10 is located in the first hole 11, the drive member 4 runs the length of the cutting head and the hedge cutter is in its retracted working position. When the pin 10 is located in the second hole 12, the cutting head is connected to the outer end of the drive member 4 and the hedge  
15 cutter is in its extended working position as illustrated in figure 2 (b). The reciprocating motion of the drive member 4 is transmitted via the pin 10, to the reciprocating bladed member 7. It will be clear to those skilled in the art that means to connect the drive member 4 with the reciprocating bladed member 7, other than the pin 10, could be used and that both direct and indirect connections between the drive member 4, and the  
20 reciprocating bladed member 7, could also be used.

As illustrated in figures 2(a) and (b) the fixed bladed member 6 is provided with first and second holes 13 and 14, aligned with the first and second holes 11 and 12 of the reciprocating bladed member 7, respectively. The holes 13 and 14 are adapted to receive the pin 10 and extend in the longitudinal direction of the cutting head 5, thus  
25 allowing the pin 10 to reciprocate the reciprocating bladed member 7, and effect the cutting action of the cutting head 5.

The pin 10 can be retracted from the holes 11, 12, 13, 14, allowing a user to relocate the pin at the available alternative location. The pin 10 is preferably biased toward the bladed members 6, 7, for instance by a spring.

5 In alternative embodiments (not illustrated) more than two holes for receiving the pin 10 may be provided along the length of the reciprocating bladed member 7, providing more than two working positions for the hedge cutter.

As illustrated in figures 3 and 4, the hedge cutter 1 is provided with a sheath 15 surrounding the drive member 4, on three sides. It will be clear that the sheath 15 can be of a variety of cross-sections including circular, oval, and polygonal. It will also be  
10 clear that the sheath can surround the drive member 4 on fewer than three sides or can surround the drive member 4 on all sides.

As illustrated in figures 3 and 4 the cutting head 5 is provided with a blade support bar 16 formed into a channel which receives the drive member 4.

The blade support bar 16 is attached to the bladed members 6, 7, by the nut 18  
15 and bolt 19, arrangements illustrated in figure 3. To allow a free reciprocating movement between the bladed members 6, 7, spacers 20 are located between the bladed members and the blade support bar 16.

When the hedge cutter is in the retracted working position the drive member 4 and the sheath 15 run further into the blade support bar 16 than in the extended working  
20 position.

As illustrated in figures 1 (a) and (b) and 3 and 4 the cross-sections of the sheath 15 and the blade support bar 16 are preferably adapted to co-operate with one another so that when the sheath 15 and the blade support bar 16 are fitted together, longitudinal movement between the two is possible but all lateral movement is restricted. In the  
25 embodiment illustrated in figures 1 (a) and (b) the cross sections of the sheath 15 and the blade support bar is substantially C-shaped. In the embodiment illustrated in figures 3 and 4 the cross sections of the sheath 15 and the blade support bar are substantially

trapezoidal. In both of these embodiments the sheath 15 nests inside the blade support bar 16. It will be clear that in alternative embodiments the blade support bar 16 may be adapted to nest within the sheath 15.

As illustrated in figures 1 (a) and (b) and 4 to 7, the hedge cutter is also provided with means 17 to semi-permanently lock the sheath 15 to the blade support bar 16. In the embodiment illustrated in figure 4 this means takes the form of a clamping system 17. The clamping system is comprised of a first member 21 shaped to closely fit over a portion of the length of the blade support bar 16, and a second member 22 shaped to engage with the first member 21. A screw mechanism is provided for releasably clamping the first and second members 21, 22, together. The first member 21 is attached to the blade support bar 16 and is provided with first and second channels 23 and 24 for engaging, respectively, first and second pegs 27, 28, provided on the sheath 15. The second member 22 is provided with first and second holes 25, 26 for engaging with the first and second pegs 27, 28 respectively. In this manner when the cutter is in its retracted configuration the first channel 23, and the first hole 25, engage with the first peg 27 and the first and second members 21 and 22 can be screwed together to lock the sheath 15 and the blade support bar 16 together. To change from the retracted configuration to the extended configuration the clamp mechanism 17 is unscrewed and the blade support bar is then slid along the sheath 15, so the second pin 28 engages with the second channel 24 and the second hole 26. The clamp mechanism is then screwed down to lock the blade support bar 16 to the sheath 15.

In the embodiment illustrated in figure 3 an elongate hole 30 is provided in the end of the blade support member 16 to allow the pin 10 to pass through and engage holes 11 and 13 on the bladed members 6, 7. Similarly a second elongate hole (not illustrated) is provided on the blade support member allowing the pin 10 to engage with the holes 12 and 14 of the bladed members.

As illustrated in figure 3 the retractable pin 10 is provided on the end of a biasing spring 29, attached to the outer end of the drive member 4. The biasing spring 29 can be made from a piece of hardened steel angled so as to bias the pin 10 toward the bladed members 6, 7. A portion of the pin 10 extends through an elongate hole in the

5 sheath 15 and is attached to a bar 31, shaped to fit closely with the sheath 15. To disengage the pin from the blade support bar 16 and bladed members 6, 7, the bar 31 is pulled upwardly and then rotated so that it rests on top of the sheath 15 and the pin can not re-engage with the blade support bar 16 or the bladed members 6, 7. To re-engage the pin 10, the bar 31 is rotated until it fits closely over the sheath allowing the pin to  
10 drop back into engagement with the blade support bar 16 and bladed members 6, 7.

To change the configuration of the cutter, the clamp mechanism is unscrewed and the pin 10 is pulled out of engagement with the blade support bar 16 and the bladed members 6, 7. The cutting head, comprising the blade support bar 16 and bladed members 6, 7, is then slid along the sheath 15, until aligned at the appropriate  
15 alternative location on the sheath 15, the clamp being screwed down to lock the sheath and blade support bar together and the pin 10 being released to engage the blade support bar 16 and the bladed members 6, 7. The pin 10 may not immediately be aligned correctly with the appropriate holes in the blade support bar 16 and the bladed members 6, 7, however because of the biasing of the spring 29, the pin 10 will re-  
20 engage when the drive shaft is reciprocated.

In a preferred embodiment (not illustrated) both bladed members 6, 7, may be reciprocating. In this embodiment the hedge cutter is provided with two reciprocating drive members, each drive member reciprocating one of the bladed members. In such an embodiment it is preferable to time the reciprocation of the bladed members so that  
25 they have opposing motions. This advantageously reduces the vibration of the hedge cutter.

## Claims

1. A hedge cutter comprising; a cutting head including first and second elongate bladed members, in which the second bladed member is adapted to move back and forth longitudinally relative to the first bladed member to effect a cutting action; drive means arranged to reciprocate the second bladed member; and means for setting a direct or indirect connection between the second bladed member and the drive means at at least two positions on the drive means so as to adjust the overall reach of the cutter.
2. A hedge cutter according to claim 1 wherein the cutting head is adapted to co-operate with the drive means at two or more locations along the length of an elongate drive member of the drive means.
3. A hedge cutter according to claim 2 wherein the cutting head is provided with an elongate blade support bar formed into a channel adapted to receive the drive member.
4. A hedge cutter according to any one of the preceding claims further comprising an elongate sheath member which co-operates with the blade support bar and extends along the length of the drive member.
5. A hedge cutter according to claim 4 when appended to claim 3, wherein the sheath and the blade support bar are to inter-engage with one another, in a manner that restricts relative movement between them to the longitudinal direction.
6. A hedge cutter according to claim 5 wherein the sheath and the blade support bar inter-lock so as to lock together in the lateral direction.

7. A hedge cutter according to any one of the preceding claims, wherein there is provided at least one retractable pin and a plurality of co-operating recesses or holes, whereby the at least one pin and the plurality of holes or recesses are adapted to  
5 directly or indirectly connect the second bladed member with the drive member.

8. A hedge cutter according to any one of claims 4 to 7 wherein there is provided means adapted to releasably lock together the sheath and the cutting head.

10 8. A hedge cutter according to claim 7 wherein, the means adapted to releasably lock together the sheath and the cutting head comprises a first member fixed to the blade support bar or the sheath and a second member adapted to releasably engage the first member.

15 9. A hedge cutter as substantially herein described with reference to any one or more of the accompanying drawings.



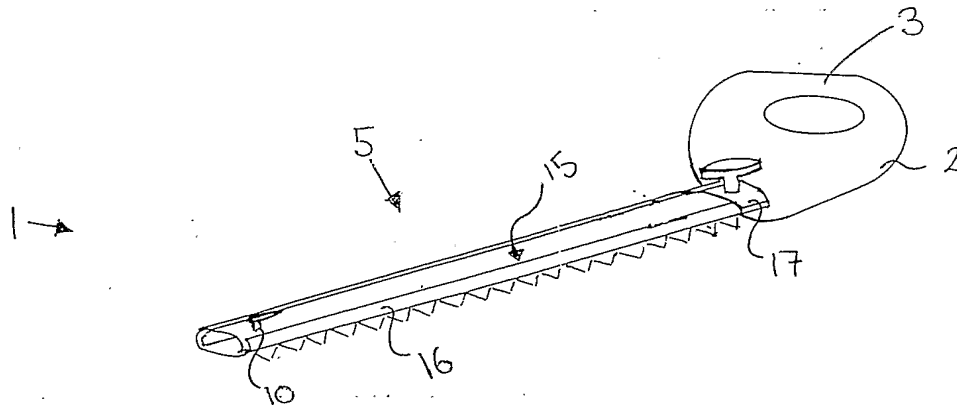


FIG. 1(a)

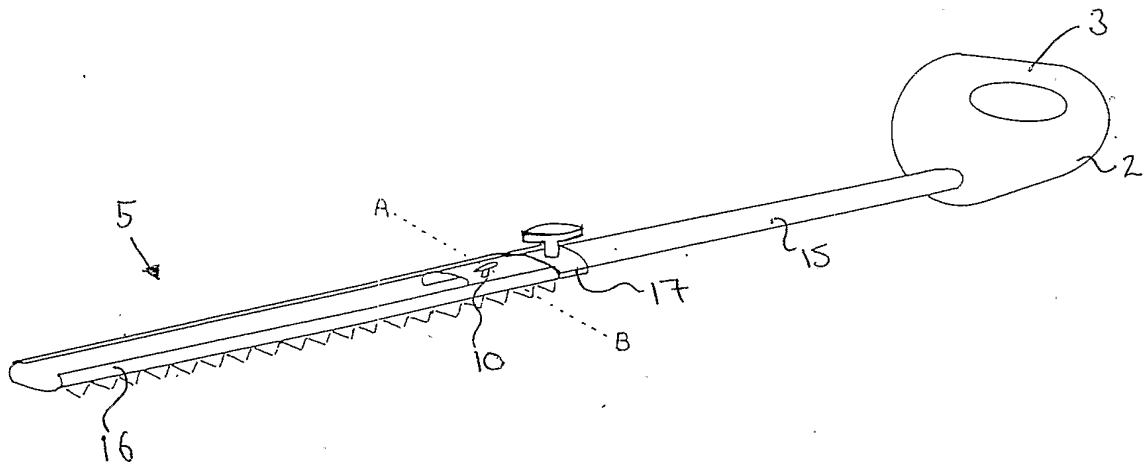


FIG. 1(b)

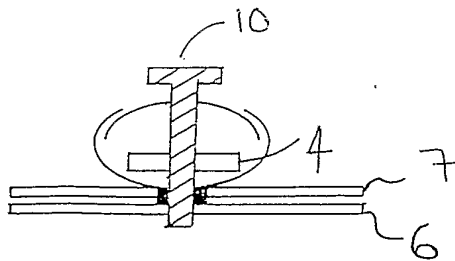


FIG. 1(c)





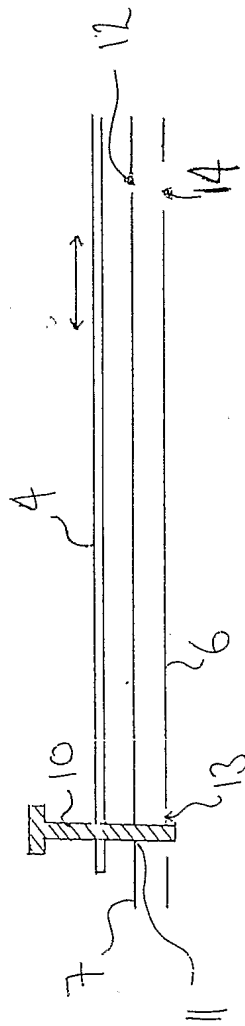


Fig. 2(a)

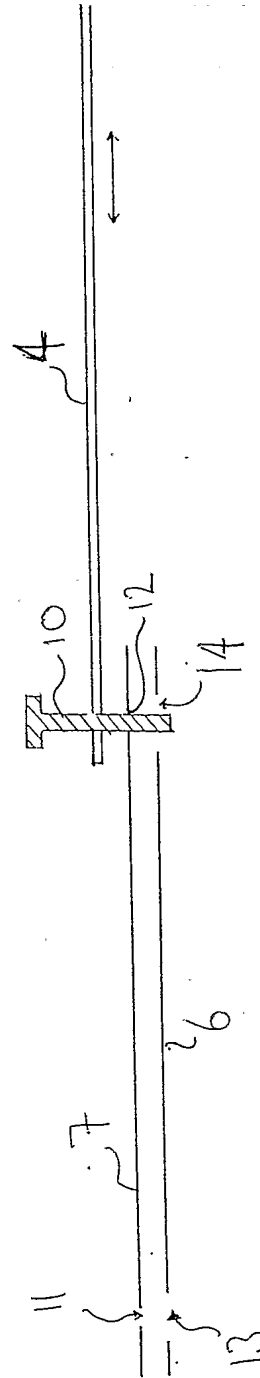


Fig. 2(b)



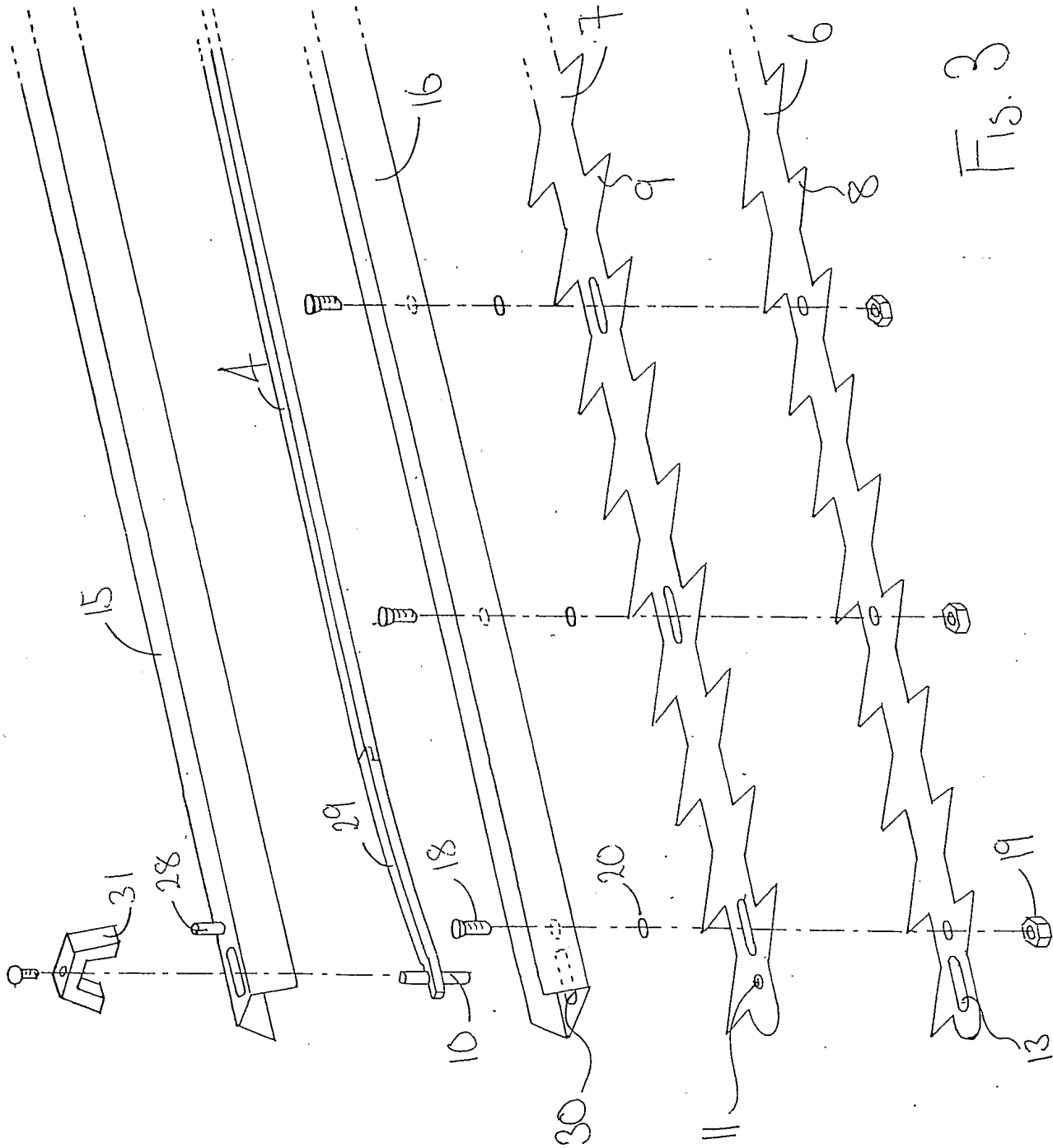
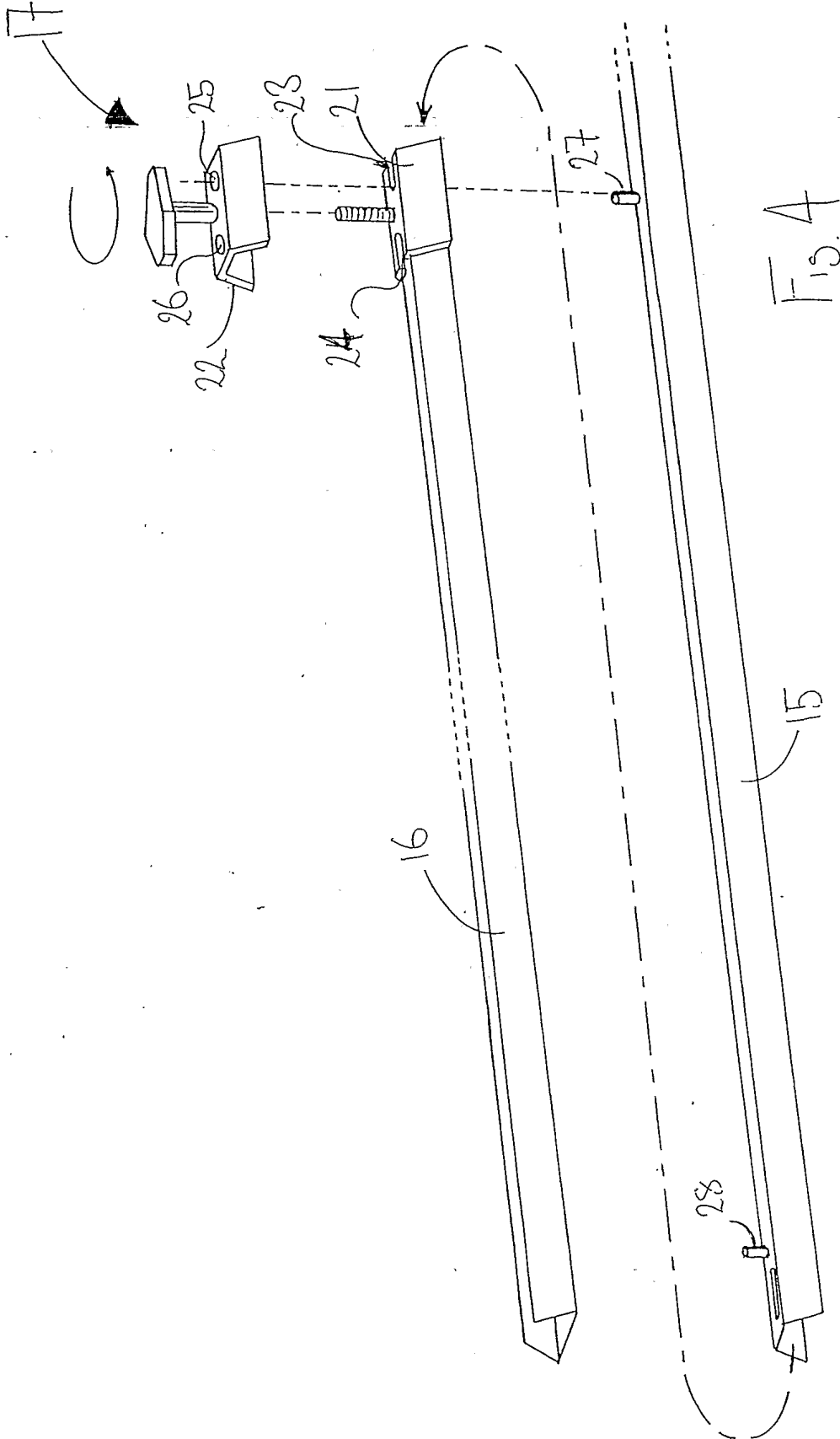


Fig. 3







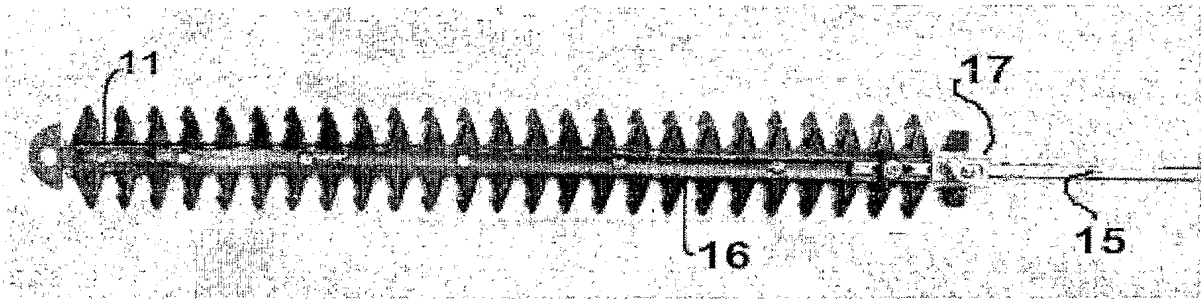


Figure 5

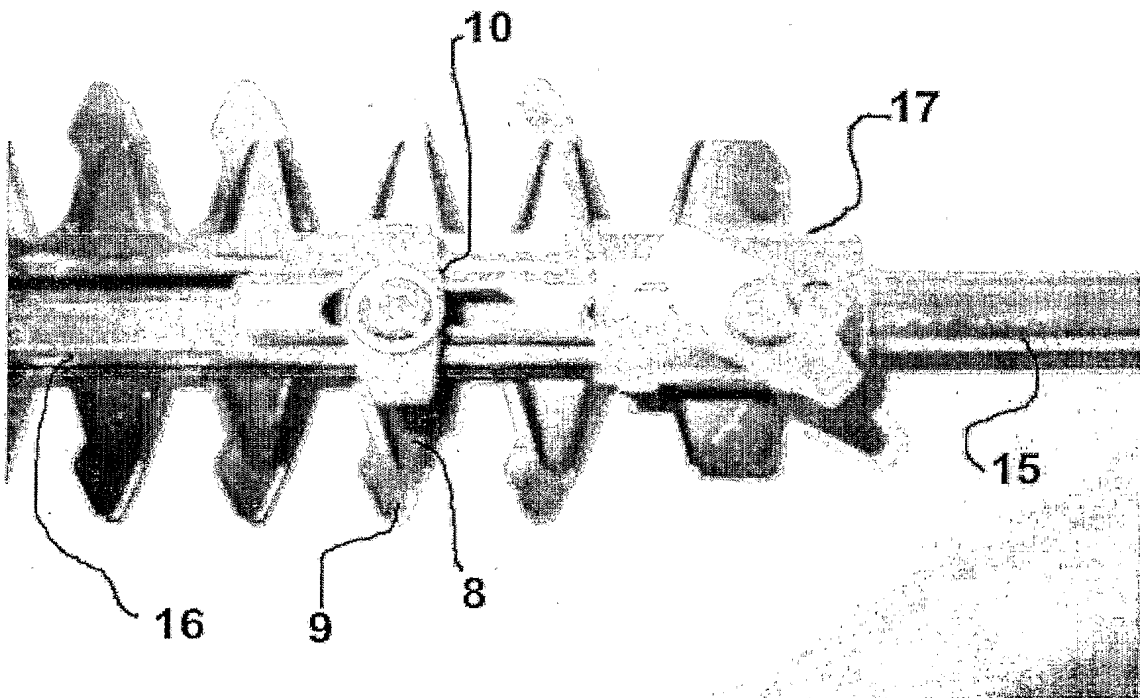


Figure 6





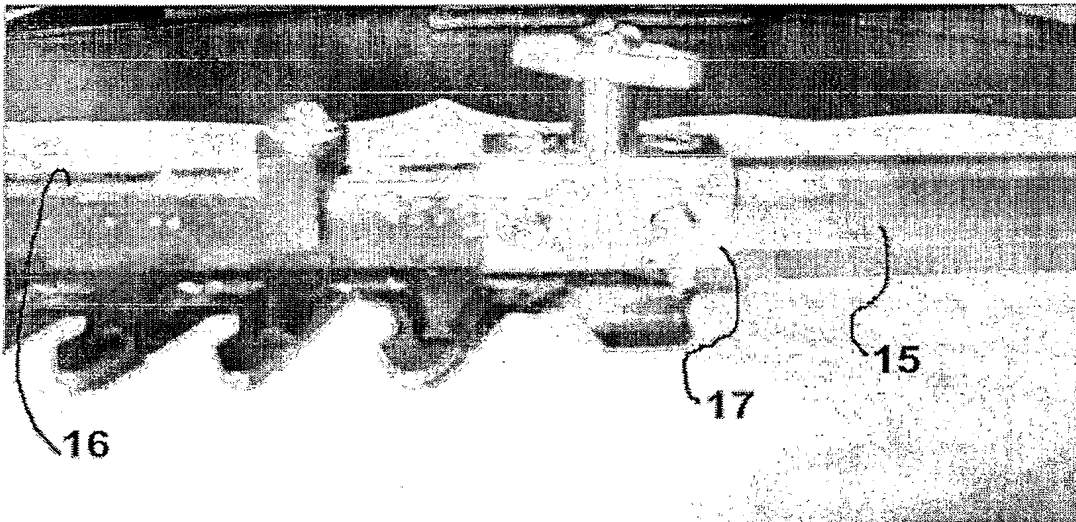


Figure 7

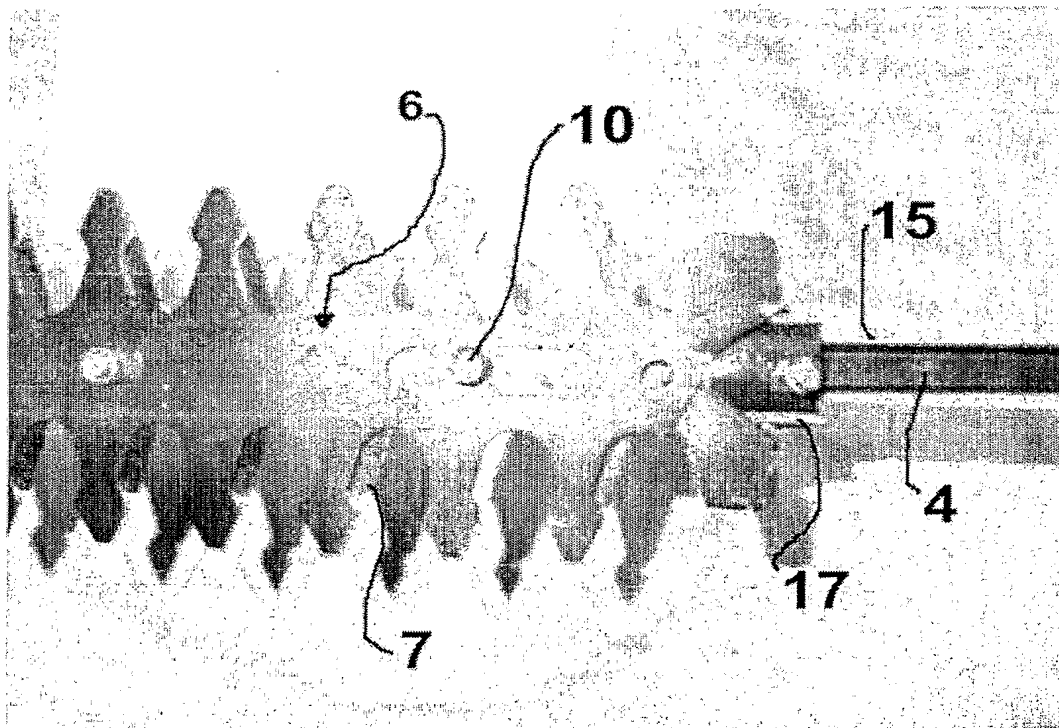


Figure 8



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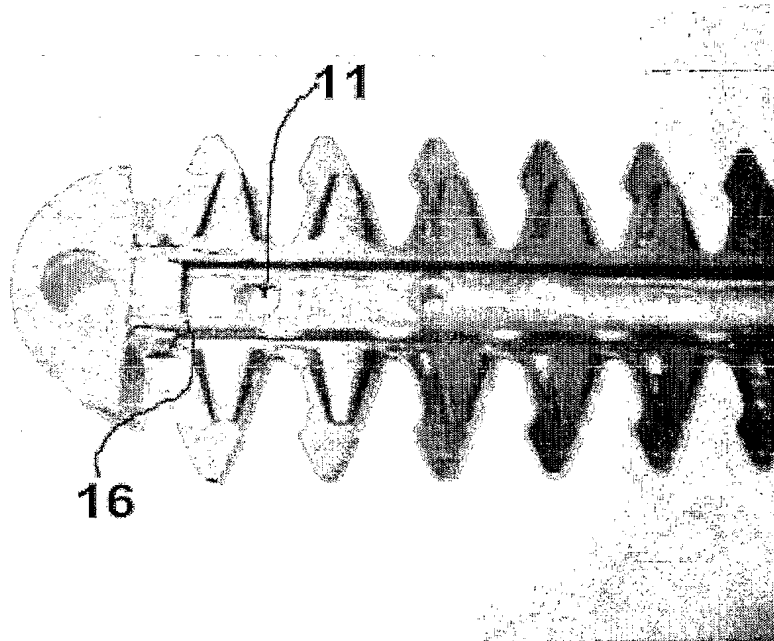


Figure 9

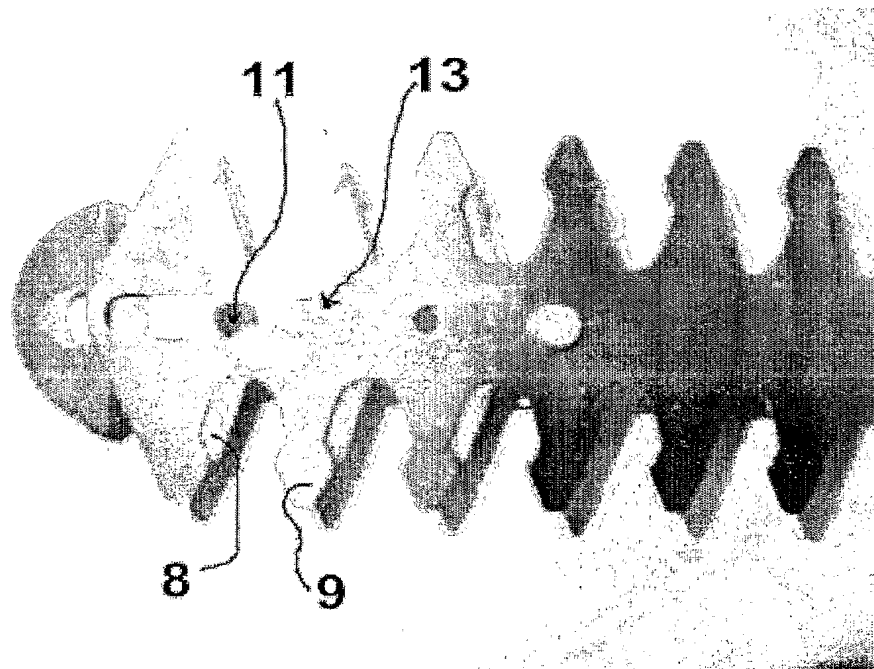


Figure 10

